

IN THE SPECIFICATION

Please replace the paragraph beginning at page 1, line 14, with the following rewritten paragraph:

Among them, in vertical shaft type windmills, there are known a drag type windmill in which a windmill is rotated by a drag generated at a blade thereof as in a paddle type, Sabonius type or the like and a lift type in which a windmill is rotated by a lift generated at a blade thereof as in Darrieus type, a gyro mill type or the like. That is, whereas the former rotates the windmill by a drag difference by reducing resistance of the blade directed to the windward, the latter rotates the windmill by the lift generated at the blade ( for example, refer to Patent Literature 1 discussed below).

Please replace the paragraph beginning at page 2, line 2, with the following rewritten paragraph:

However, in the case of the former of the vertical shaft type ( drag type ), there poses a problem that when a peripheral speed ratio ( blade end speed/wind speed ) becomes 1, a moment for rotating the windmill more than the peripheral speed ratio is not generated, even when the wind speed is increased, a rotational number more than the wind speed cannot be achieved and a power generation efficiency is poor. Meanwhile, in the case of the latter ( lift type ), when the peripheral speed ratio is equal to or ~~larger~~ larger than 1, ~~an the~~ the aerodynamic property of the windmill is improved and the windmill can be rotated efficiently, ~~however~~. However, when the peripheral speed is smaller than 1, the aerodynamic property of the windmill is deteriorated and the moment for rotating the windmill is reduced. Further, there is a drawback that a starting moment is small and starting from a stationary state becomes very difficult.

Please replace the paragraph beginning at page 2, line 20, with the following rewritten paragraph:

Hence, there is known, for example, the device shown in Patent Literature 2 (JP-A-2001-132615) or the like which increases the power generation efficiency by improving the shape of the blade. The publication discloses a windmill of the propeller type ( lift type ) of a horizontal shaft type, as shown by Fig. 7, there is disclosed a constitution in which a plurality of windmill blades 53 are provided at constant angles from a rotating shaft 51 via a rotor 52 in a face orthogonal to the rotating shaft 51, wherein the insides of the respective windmill blades 53 are provided with auxiliary blades 54 included therein extractably and retractably to and from respective front ends thereof, at a low wind speed region, the auxiliary blade 54 is projected from a position designated by two-dotted chain lines at inside of the windmill blade 53 to an upper side of Fig. 7 in an arrow mark direction of Fig. 7 and ~~a~~the rotational torque is increased by increasing the lift.

Please delete the subtitles at page 3, lines 19 and 20, as follows:

~~[Patent Literature 2]~~

~~JP-A 2001-132615~~

Please replace the paragraph beginning at page 3, line 21, with the following rewritten paragraph:

Incidentally, as shown by Fig. 8, Patent Literature 1 discloses a vertical shaft type windmill in which a rotor shaft 61 is attached with a blade fixing plate 62 and a bent blade ( ~~blade~~ ) 63 is attached to the rotor shaft 61 by an angle of elevation of 0 ~~degree~~ degrees relative to a rotor shaft 61 between the blade fixing plates 62. However, according to Patent

Literature 1, only an example of bending the blade (~~blade~~) 63 is shown and a specific structure of the blade (~~blade~~) 63 is not disclosed at all.

Please replace the paragraph beginning at page 4, line 7, with the following rewritten paragraph:

Hence, it is object of the invention to provide a windmill for wind power generation having a high power generation efficiency by enabling one to rotate the windmill with an excellent power generation efficiency at a wind speed region of a wide range by improving a shape of a blade of a vertical shaft type windmill.

Please replace the paragraph beginning at page 4, line 13, with the following rewritten paragraph:

The above-described object of the invention is achieved by a windmill for wind power generation comprising a plurality of blades at every constant ~~angles~~ angle centering on a vertical rotating shaft in a face orthogonal to the vertical rotating shaft, wherein the blade is constituted by a blade type having a high lift coefficient at a low ~~Raynolds~~ Reynolds number and a notch portion is formed at a rear end portion of a lower face of the blade.

Please replace the paragraph beginning at page 4, line 22, with the following rewritten paragraph:

Further, the above-described object can effectively be achieved by making the ~~Raynolds~~ Reynolds number fall in a range of 30,000 through 3,000,000.

Please replace the paragraph beginning at page 5, line 25, with the following rewritten paragraph:

An embodiment of the invention will be explained ~~in~~with reference to the drawings as follows.

Please replace the paragraph beginning at page 6, line 2, with the following rewritten paragraph:

Fig. 1 shows ~~an outlook of~~ a windmill A for wind power generation according to an embodiment of the invention. The windmill A is a vertical shaft type windmill for generating power by utilizing a rotational force of the windmill by wind power. As shown by Fig. 1 and Fig. 2, the windmill A is arranged with blades 2, 2' of a four sheets blade type comprising an aluminum alloy, plastic ( including FRP ) or the like in parallel with a rotating shaft along a direction of a circumference of the same radius in a face orthogonal to the rotating shaft 1 extended in a vertical direction. As shown by Fig. 3, an outer skin of the blade 2 is formed in a blade type having a streamline shape by bending a material of a thin plate shape comprising a material of an aluminum alloy, plastic ( including FRP ) in a one sheet structure.

Please replace the paragraph beginning at page 7, line 4, with the following rewritten paragraph:

Further, the blade 2 is formed in a blade type having a streamline shape used in an aeroplane represented by a ~~4-like four blade type blade system-blade type~~, an RAF blade type, a Gettingen blade type or the like and a notch portion B is formed at a rear edge portion of a lower face of the blade. The lower face of the blade is notched from a position of between 35% through 45% from a front edge a over to a rear edge b according to the aerodynamic property of the blade. As a result, the blade 2 is formed in a blade type constituting a high lift coefficient at low Reynolds number. Further, as shown by Fig. 4, a

chord c of the blade 2 is attached by an angle of 0 ~~degree~~ degrees through 5 degrees relative to a wind direction to the blade 2 ( arrow mark direction of Fig. 4 ).

Please replace the paragraph beginning at page 7, line 18, with the following rewritten paragraph:

Further, as shown by Fig. 5, a surrounding of the blade 2 is formed with a pressure distribution in correspondence with a wind from a front side ( arrow mark direction of Fig. 5 ). That is, according to the pressure distribution of the blade type used in the blade 2, a pressure higher than an outside atmospheric pressure is distributed to a front portion of the lower face of the blade, a pressure substantially the same as the outside atmospheric pressure is constituted at a rear portion thereof, at an upper face thereof, the flow speed is accelerated by the blade shape at a front end thereof and therefore, the pressure is reduced. Therefore, even when the notch portion B is provided at the rear portion of the lower face of the blade 2, the aerodynamic property of the blade is not considerably ~~inconsiderably~~ influenced thereby.

Please replace the paragraph beginning at page 8, line 8, with the following rewritten paragraph:

Therefore, as shown by Fig. 6, when the blade 2 receives a wind from a front side ( arrow mark A1 direction of the drawing ), a lift is generated in the direction of an arrow mark L ~~direction of in~~ the drawing. Therefore, the windmill is rotated in the counterclockwise direction by a component force in the rotational direction ( L1 ) of the lift generated at the blade 2.

Please replace the paragraph beginning at page 8, line 24, with the following rewritten paragraph:

As a result, since the blade 2 is formed with the notch portion B at the lower face of the blade, at a low wind speed region in which the peripheral speed ratio is equal to or smaller than 1, the rotational moment is produced by the air resistance with respect to the wind in the arrow mark A2 direction of Fig. 6, the rotational moment is added to the component force in the rotational direction ( L1 ) of the lift generated at the blade 2 receiving the wind from the arrow mark A1 direction of Fig. 6 to rotate the blade and at a high wind speed region in which the peripheral speed ratio is higher than 1, the windmill is rotated by the lift generated at the blade 2. That is, since the blade 2 is formed in the blade type constituting the high lift at low ~~Raynolds~~Reynolds number, the blade 2 can be rotated by any wind speed and power can be generated efficiently.

Please replace the paragraph beginning at page 9, line 20, with the following rewritten paragraph:

Therefore, according to the embodiment, although the notch portion B is formed at the rear edge portion of the blade lower face of the blade 2, since the blade type having the high lift coefficient at low ~~Raynolds~~Reynolds number is used, the air resistance and the lift are generated at the blade 2 by wind and the blade 2 is rotated by the forces. Therefore, the rotational moment necessary for power generation can be generated at the blade 2 in any wind direction and at any wind speed. As a result, the blade 2 can be rotated over a wind speed region in a wide range.

Please replace the paragraph beginning at page 11, line 6, with the following rewritten paragraph:

As described above, according to the windmill for wind power generation of the invention, in the windmill for wind power generation comprising the plurality of blades at

~~every~~ each of the constant angles centering on the vertical rotating shaft in the face orthogonal to the vertical rotating shaft, the blade is formed by notching the rear edge portion of the lower face of the blade to constitute the blade type in the streamline shape having the high lift coefficient at low ~~Raynolds~~ Reynolds number. That is, the blade is rotated by air resistance or lift by a component force of the wind and therefore, the blade ~~and therefore~~, namely the windmill, can be rotated with excellent power generation efficiency by effectively combining the property of the drag type windmill and the property of the lift type windmill ~~even~~ with respect to wind at any wind speed and in any wind direction, particularly even at a low wind speed region ~~in~~ when starting or ~~by~~ with weak wind. Further, the vertical shaft type windmill is only provided with the notch portion at a portion of the lower face of the blade and therefore, the windmill is made to be compact by the simple structure, a small-sized or a middle-sized windmill can be fabricated inexpensively and easily and a wide range of modes of utilization such as a buoy installed on the sea or a generator for household use or the like can be realized.

Please amend the Abstract at page 14, lines 1-14 on a separate sheet to read as follows: